Lta 4 (2) STAMP 0042532

JUL 14 1995

ENGINEERING DATA TRANSMITTAL

1. EDT No 612741

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
TFTP Environmental Compliance	TFTP Environmental Compliance	609528
5. Proj./Prog./Dept./Div.:	6. Cog. Engr.:	7. Purchase Order No.:
Tank Waste Remediation System	J. D. Guberski	n/a
8. Originator Remarks: This engineering data package provides supporting data for preparation of the TWRS Environmental Impact Statement. Data in this document complements data provided in separate documentation for the In-Situ Disposal Alternative, the No Separations Alternative, the Extensive Separations Alternative, the Tri-Party Agreement Alternative, and the No Disposal Action Alternative. Environmental, Safety, and QA approvals required by WHC-CM-3-5 Section 12.7 were obtained on Rev. C of this document (EDT 609528). The only significant changes in this revision, relative to Rev. C, involved adding JD Guberski as an author as CG Golberski is no longer employed by WHC.		9. Equip./Component No.: n/a
		10. System/Bldg./Facility: n/a
11. Receiver Remarks:		12. Major Assm. Dwg. No.: n/a
		13. Permit/Permit Application No.: n/a
		14. Required Response Date: n/a

DEC 1995 RECEIVED EDMC

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-WM-EV-102		0	Single-Shell and Double-Shell Tank Waste Inventory Data Package for the Tank Waste Remediation System Environmental Impact Statement	E/S/Q	2	1	1

16. KEY		
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

(G) Reason	(H) Disp.	17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures) (J) Name (K) Signature (L) Date (M) MSIN	(G) Reason	(H) Disp.
2	1	Cog.Eng. J. D. Guberski		
2	1	Cog. Mgr. L. E. Borneman		

(J) Name (K) Signature (L) Date (M) MSIN	(G) Reason	(H) Disp.
QA (approved by J. Weber, on EDT 609528)		
Safety (approved by J. M. Garcia on EDT 609528)		
Env. (approved by W. T. Dixon on EDT 609528)		

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
J. D. Guberski 7/13/95	L. E. Borneman 7/12/95	L. E. Borneman 7/14/95	[ ] Approved [ ] Approved w/comments [ ] Disapproved w/comments [x] Not Required per Waiver WA-557
Signature of EDT Originator Date	Authorized Representative for Receiving Organization Date	Cognizant Manager Date	

)-7400-172-2 (04/94) GEF097

INSTRUCTIONS FOR COMPLETION OF THE ENGINEERING DATA TRANSMITTAL

(USE BLACK INK OR TYPE)

BLOCK	TITLE	
(1) *	EDT	• Pre-assigned EDT number.
(2)	To: (Receiving Organization)	• Enter the individual's name, title of the organization, or entity (e.g., Distribution) that the EDT is being transmitted to.
(3)	From: (Originating Organization)	• Enter the title of the organization originating and transmitting the EDT.
(4)	Related EDT No.	• Enter EDT numbers which relate to the data being transmitted.
(5) *	Proj./Prog./Dept./Div.	• Enter the Project/Program/Department/Division title or Project/Program acronym or Project Number, Work Order Number or Organization Code.
(6) *	Cognizant Engineer	• Enter the name of the individual identified as being responsible for coordinating disposition of the EDT.
(7)	Purchase Order No.	• Enter related Purchase Order (P.O.) Number, if available.
(8) *	Originator Remarks	• Enter special or additional comments concerning transmittal, or "Key" retrieval words may be entered.
(9)	Equipment/Component No.	• Enter equipment/component number of affected item, if appropriate.
(10)	System/Bldg./Facility	• Enter applicable system, building or facility number, if appropriate.
(11)	Receiver Remarks	• Enter special or additional comments concerning transmittal.
(12)	Major Assm. Dwg. No.	• Enter applicable drawing number of major assembly, if appropriate.
(13)	Permit/Permit Application No.	• Enter applicable permit or permit application number, if appropriate.
(14)	Required Response Date	• Enter the date a response is required from individuals identified in Block 17 (Signature/Distribution).
(15) *	Data Transmitted	
	(A) * Item Number	• Enter sequential number, beginning with 1, of the information listed on EDT.
	(B) * Document/Drawing No.	• Enter the unique identification number assigned to the document or drawing being transmitted.
	(C) * Sheet No.	• Enter the sheet number of the information being transmitted. If no sheet number, leave blank.
	(D) * Rev. No.	• Enter the revision number of the information being transmitted. If no revision number, leave blank.
	(E) Title or Description of Data Transmitted	• Enter the title of the document or drawing or a brief description of the subject if no title is identified.
	(F) * Approval Designator	• Enter the appropriate Approval Designator (Block 15). Also, indicate the appropriate approvals for each item listed, i.e., SQ, ESQ, etc.
	(G) Reason for Transmittal	• Enter the appropriate code to identify the purpose of the data transmittal (see Block 16).
	(H) Originator Disposition	• Enter the appropriate disposition code (see Block 16).
	(I) Receiver Disposition	• Enter the appropriate disposition code (see Block 16).
(16)	Key	• Number codes used in completion of Blocks 15 (G), (H), and (I), and 17 (G), (H) (Signature/Distribution).
(17)	Signature/Distribution	
	(G) Reason	• Enter the code of the reason for transmittal (Block 16).
	(H) Disposition	• Enter the code for the disposition (Block 16).
	(J) Name	• Enter the signature of the individual completing the Disposition 17 (H) and the Transmittal.
	(K) * Signature	• Obtain appropriate signature(s).
	(L) * Date	• Enter date signature is obtained.
	(M) * MSIN	• Enter MSIN. Note: If Distribution Sheet is used, show entire distribution (including that indicated on Page 1 of the EDT) on the Distribution Sheet.
(18)	Signature of EDT Originator	• Enter the signature and date of the individual originating the EDT (entered prior to transmittal to Receiving Organization). If the EDT originator is the cognizant engineer, sign both Blocks 17 and 18.
(19)	Authorized Representative for Receiving Organization	• Enter the signature and date of the individual identified by the Receiving Organization as authorized to approve disposition of the EDT and acceptance of the data transmitted, as applicable.
(20) *	Cognizant Manager	• Enter the signature and date of the cognizant manager. (This signature is authorization for release.)
(21) *	DOE Approval	• Enter DOE approval (if required) by signature or control number that tracks the approval to a signature, and indicate DOE action.

*Asterisk denote the required minimum items check by Configuration Documentation prior to release; these are the minimum release requirements.

9513385.1684

EDT-612741

ENGINEERING DATA TRANSMITTAL

1. EDT 609528

EDT-612741

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
LE Borneman, TWRS Compliance Plans	WB Barton, TWRS Engineering Integration	na
5. Proj./Prog./Dept./Div.:	**6. Cog. Engr.:**	**7. Purchase Order No.:**
TWRS	CE Golberg	
8. Originator Remarks:		**9. Equip./Component No.:**
This document is being approved for transmittal to DOE for review and approval		na
		10. System/Bldg./Facility:
		NA
11. Receiver Remarks:		**12. Major Assm. Dwg. No.:**
		NA
		13. Permit/Permit Application No.:
		na
		14. Required Response Date:

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-EV-102		C	Single-Shell and Double-Shell Tank Waste Inventory Data Package for The Tank Waste Remediation System Environmental Impact Statement	ESQ	1	1	

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

(G) Reason	(H) Disp.	17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures) (J) Name (K) Signature (L) Date (M) MSIN	(J) Name (K) Signature (L) Date (M) MSIN	(G) Reason	(H) Disp.
1	1	Cog.Eng. CE Golberg [signature] 1-29-95 H5-49	JD Honeyman [signature] 1-21-95 S7-81	1	1
1	1	Cog. Mgr. JS Garfield [signature] H5-49			
1	1	QA J. Weber [signature] 1-27-95			
1	1	Safety JM Garcia [signature] 1/30/95 23-09			
1	1	Env. WT Dixon [signature] 1-30-95 H6-21			
1	1	WB Barton [signature] 1/30/95 H5-27			
1	1	LE Borneman [signature] 1/30/95 82-06			

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
WB Barton [signature] 1/30/95	ML Dieffenbaugh [signature] 01/30/95	JS Garfield [signature] 1/30/95	[ ] Approved [ ] Approved w/comments [ ] Disapproved w/comments
Signature of EDT Originator Date	Authorized Representative for Receiving Organization Date	Originant Manager Date	

INSTRUCTIONS FOR COMPLETION OF THE ENGINEERING DATA TRANSMITTAL

(USE BLACK INK OR TYPE)

BLOCK	TITLE	
(1)*	EDT	• Pre-assigned EDT number.
(2)	To: (Receiving Organization)	• Enter the individual's name, title of the organization, or entity (e.g., Distribution) that the EDT is being transmitted to.
(3)	From: (Originating Organization)	• Enter the title of the organization originating and transmitting the EDT.
(4)	Related EDT No.	• Enter EDT numbers which relate to the data being transmitted.
(5)*	Proj./Prog./Dept./Div.	• Enter the Project/Program/Department/Division title or Project/Program acronym or Project Number, Work Order Number or Organization Code.
(6)*	Cognizant Engineer	• Enter the name of the individual identified as being responsible for coordinating disposition of the EDT.
(7)	Purchase Order No.	• Enter related Purchase Order (P.O.) Number, if available.
(8)*	Originator Remarks	• Enter special or additional comments concerning transmittal, or "Key" retrieval words may be entered.
(9)	Equipment/Component No.	• Enter equipment/component number of affected item, if appropriate.
(10)	System/Bldg./Facility	• Enter applicable system, building or facility number, if appropriate.
(11)	Receiver Remarks	• Enter special or additional comments concerning transmittal.
(12)	Major Assm. Dwg. No.	• Enter applicable drawing number of major assembly, if appropriate.
(13)	Permit/Permit Application No.	• Enter applicable permit or permit application number, if appropriate.
(14)	Required Response Date	• Enter the date a response is required from individuals identified in Block 17 (Signature/Distribution).
(15)*	Data Transmitted	
	(A)* Item Number	• Enter sequential number, beginning with 1, of the information listed on EDT.
	(B)* Document/Drawing No.	• Enter the unique identification number assigned to the document or drawing being transmitted.
	(C)* Sheet No.	• Enter the sheet number of the information being transmitted. If no sheet number, leave blank.
	(D)* Rev. No.	• Enter the revision number of the information being transmitted. If no revision number, leave blank.
	(E) Title or Description of Data Transmitted	• Enter the title of the document or drawing or a brief description of the subject if no title is identified.
	(F)* Approval Designator	• Enter the appropriate Approval Designator (Block 15). Also, indicate the appropriate approvals for each item listed, i.e., SQ, ESQ, etc.
	(G) Reason for Transmittal	• Enter the appropriate code to identify the purpose of the data transmittal (see Block 16).
	(H) Originator Disposition	• Enter the appropriate disposition code (see Block 16).
	(I) Receiver Disposition	• Enter the appropriate disposition code (see Block 16).
(16)	Key	• Number codes used in completion of Blocks 15 (G), (H), and (I), and 17 (G), (H) (Signature/Distribution).
(17)	Signature/Distribution	
	(G) Reason	• Enter the code of the reason for transmittal (Block 16).
	(H) Disposition	• Enter the code for the disposition (Block 16).
	(J) Name	• Enter the signature of the individual completing the Disposition 17 (H) and the Transmittal.
	(K)* Signature	• Obtain appropriate signature(s).
	(L)* Date	• Enter date signature is obtained.
	(M)* MSIN	• Enter MSIN. Note: If Distribution Sheet is used, show entire distribution (including that indicated on Page 1 of the EDT) on the Distribution Sheet.
(18)	Signature of EDT Originator	• Enter the signature and date of the individual originating the EDT (entered prior to transmittal to Receiving Organization). If the EDT originator is the cognizant engineer, sign both Blocks 17 and 18.
(19)	Authorized Representative for Receiving Organization	• Enter the signature and date of the individual identified by the Receiving Organization as authorized to approve disposition of the EDT and acceptance of the data transmitted, as applicable.
(20)*	Cognizant Manager	• Enter the signature and date of the cognizant manager. (This signature is authorization for release.)
(21)*	DOE Approval	• Enter DOE approval (if required) by signature or control number that tracks the approval to a signature, and indicate DOE action.

*Asterisk denote the required minimum items check by Configuration Documentation prior to release; these are the minimum release requirements.

RELEASE AUTHORIZATION	
Document Number:	WHC-SD-WM-EV-102, REV 0
Document Title:	Single-Shell and Double-Shell Tank Waste Inventory Data Package for the Tank Waste Remediation System Environmental Impact Statement
Release Date:	7/14/95

This document was reviewed following the procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Kara M. Broz — 7/14/95

SUPPORTING DOCUMENT

1. Total Pages 16

2. Title	3. Number	4. Rev No.
Single-Shell and Double-Shell Tank Waste Inventory Data Package for the Tank Waste Remediation System Environmental Impact Statement	WHC-SD-WM-EV-102	0

5. Key Words	6. Author
Inventory, TWRS EIS, Environmental Impact Statement, Data Package, Single-Shell, Double-Shell, SST, DST, Tank, TRAC	Name: C. E. Golberg J. D. Guberski Signature Organization/Charge Code 77510/D1DAA

7. Abstract

Describes the single-shell tank (SST) and double-shell (DST) tank nonradioactive chemical and radionuclides inventory tables for the Hanford Site to support preparation of the Tank Waste Remediation System Environmental Impact Statement.

8. RELEASE STAMP

WHC-SD-WM-EV-102 Rev. 0
UC-630

Single-Shell and Double-Shell Tank Waste Inventory Data Package for the Tank Waste Remediation System Environmental Impact Statement

C. E. Golberg
J. D. Guberski

Date Published
July 1995

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

Westinghouse Hanford Company
P.O Box 1970
Richland, Washington

Management and Operations Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Approved for Public Release

CONTENTS

LIST OF TABLES

LIST OF TERMS

DST	double-shell tank
IDB	Integrated Data Base
SST	single-shell tank
TRAC	Track Radioactive Components

1.0 INTRODUCTION

This document describes the single-shell tank (SST) and double-shell tank (DST) nonradioactive chemical and radionuclide inventory tables for the Hanford Site. The inventories presented here are identical to those for the 1994 Integrated Data Base (IDB) report (Powell 1994).

2.0 TANK WASTE INVENTORY DESCRIPTION

The tank waste inventory tables for nonradioactive chemical components, radionuclides, and future tank waste are described in this section. The ion charges are assumed as presented for the nonradioactive chemical components. The radionuclide amounts are reported in curies while stable chemical amounts are shown in metric tons. The radionuclide data for both SSTs and DSTs have been decayed to December 31, 1999. The inventories are presented on a total tank basis. The estimated future waste generation is displayed by cubic meters of a specific waste type and the period each facility will be generating the stated waste type.

2.1 NONRADIOACTIVE CHEMICAL INVENTORY

Table 1 lists the total chemical inventory by waste type for both SSTs and DSTs. Except for the PO_4^{-3} value, the total SST inventory is based on what is provided in Table 2-5 (RHO 1985). The total SST inventory is based primarily on purchase records and other historical process records. The revision to PO_4^{-3} includes removing approximately 4,200 metric tons to account for cribbing operations (Waite 1991).

The split between sludge, salt cake, and interstitial liquids shown in Table 1 is modified from the split in Table 2-5 (RHO 1985). The relative splits were derived using the water wash factors from Table G1-1 of the *Tank Waste Technical Options Report*, Appendix G (Boomer et al. 1993). The wash factors are based on the analytical results from several SST core samples. Table 2-5 assumes that jet-pumping of SSTs has been completed. Jet pumping is expected to transfer approximately 1.4E + 07 liters of liquid from SSTs to DSTs until its completion at the end of FY2000.

Future updates to the SST nonradioactive chemical inventory will include the Los Alamos National Laboratory historical data and tank characterization reports and modifications to the chloride, chromium, and aluminum inventory.

Table 1. Estimated Mass of Nonradioactive Chemical Components of Single-Shell[1] and Double-Shell Tank[2] Wastes in Metric Tons. (2 sheets)

Chemical	Single-Shell Tanks				Double-Shell Tanks			Grand Total
	Sludge	Saltcake	Interstitial Liquid	Total	Soluble	Insoluble	Total	
Ag^{+}					3.28E-01	1.38E+00	1.70E+00	1.70E+00
$Al(OH)_4^-$	6.25E+02	1.25E+03	4.57E+02	2.33E+03	5.09E+03		5.09E+03	7.43E+03
Al^{+3} [3]	1.99E+03			1.99E+03		6.78E+01	6.78E.01	2.06E+03
As^{+5}					7.70E-01	4.98E-01	1.27E+00	1.27E+00
B^{+3}					5.19E-01	9.94E-01	1.51E+00	1.51E+00
Ba^{+2}					7.91E-01	3.09E+00	3.88E+00	3.88E+00
Be^{+2}					8.19E-02	7.61E-03	8.95E-02	8.95E-02
Bi^{+3}	2.61E+02			2.61E+02	2.26E+00		2.26E+00	2.64E+02
Ca^{+2}	1.28E+02			1.28E+02	1.03E+01	1.15E+01	2.18E+01	1.50E+02
Cd^{+2}	3.84E+00			3.84E+00	1.67E-01	6.01E+00	6.18E.00	1:00E+01
Ce^{+3}	2.35E+02			2.35E+02	2.26E-02	3.04E+00	3.07E+00	2.38E+02
Cl^-	4.00E+01			4.00E+01	2.73E+02	1.49E+00	2.74E+02	3.14E+02
CO_3^{-2}	1.15E+03	4.13E+02	3.96E+01	1.61E+03	1.92E+03	5.83E+01	1.98E+03	3.59E+03
Cr^{+3}	8.63E+01			8.63E+01		3.41E+01	3.41E+01	1.20E+02
CrO_4^{-2}			2.14E+01	2.14E+01	1.20E+02		1.20E+02	1.41E+02
Cu^{+2}					1.77E-01	7.46E-01	9.23E-01	9.23E-01
F^-	8.00E+02		5.00E+01	8.05E+02	3.52E+02	1.91E+01	3.71E+02	1.18E+03
$Fe(CN)_6^{-4}$	3.22E+02			3.22E+02				3.22E+02
Fe^{+3}	6.27E+02			6.27E+02	8.09E+00	1.42E+02	1.50E+02	7.77E+02
Hg^{+}	9.00E-01			9.00E-01	5.84E-02		5.84E-02	9.58E-01
K^{+}					5.46E+02	2.02E+01	5.66E+02	5.66E+02
La^{+}					2.19E-01	2.10E+01	2.12E+01	2.12E+01
Li^{+}					5.77E-03	2.46E-02	3.04E-02	3.04E-02
Mg^{+2}					9.65E-01	1.10E+01	1.20E+01	1.20E+01
Mn^{+4}	1.20E+02			1.20E+02	7.69E+00	1.80E+01	2.57E+01	1.46E+02
Mo^{+6}					4.87E+00	8.01E-01	5.67E+00	5.67E+00
Na^{+}	1.58E+04	3.39E+04	2.30E+03	5.48E+04	1.40E+04	2.30E+02	1.43E+04	6.91E+04
Ni^{+2}	1.78E+02			1.78E+02	4.07E+00	6.57E+00	1.06E+01	1.89E+02
NO_2^-	2.00E+03	1.53E+03	1.27E+03	4.80E+03	4.80E+03	8.42E+00	4.81E+03	9.61E+03
NO_3^-	1.48E+04	8.03E+04	1.71E+03	9.68E+04	1.03E+04	3.91E+01	1.03E+04	1.07E+05
OH^-	4.22E+03	8.51E+02	3.15E+02	5.39E+03	2.33E+03	1.23E+02	2.45E+03	7.84E+03
Pb^{+4}					1.96E+00	3.28E+00	5.24E+00	5.24E+00
PO_4^{-3}	3.89E+03	6.43E+02	8.58E+01	4.62E+03	3.29E+02	2.16E+01	3.51E+02	4.97E+03
SiO_3^{-2}	1.21E+03			1.21E+03	1.53E+01	2.14E+02	2.29E+02	1.44E+03
SO_4^{-2}	5.01E+02	1.15E+03		1.65E+03	3.86E+02	6.68E+00	3.93E+02	2.04E+03
Sr^{+2}	3.60E+01			3.60E+01				3.60E+01
TOC [4]			2.00E+02	2.00E+02	1.26E+03	6.84E+01	1.33E+03	1.53E+03
UO_2^{+2}					3.54E+00	2.68E+01	3.03E+01	3.03E+01
V^{+5}					6.20E-02	1.88E-01	2.50E-01	2.50E-01
W^{+4}	1.44E+01			1.44E+01	7.47E-01		7.47E-01	1.52E+01
Zn^{+2}					3.59E+00	9.45E-01	4.54E+00	4.54E+00
Zr^{+4}	2.46E+02			2.46E+02	4.48E-01	2.77E+02	2.77E+02	5.24E+02
Total w/o H_2O	4.93E+04	1.23E+05	6.40E+03	1.79E+05	4.18E+04	1.45E+03	4.32+04	2.22E+05
H_2O	2.62E+04	1.40E+04	5.16E+03	4.54E+04	8.59E+04		8.95+04	1.35E+05
Total	7.55E+04	1.37E+05	1.16E+04	2.24E+05	1.31E+05	1.45E+03	1.33E+05	3.57E+05

Table 1. Estimated Mass of Nonradioactive Chemical Components of Single-Shell[1] and Double-Shell Tank[2] Wastes in Metric Tons. (2 sheets)

Notes:

[1]Total values taken from Table 2-5 (RHO 1985).

[2]Total values taken from Castaing 1993, Gerboth 1987, Hendrickson 1994, Herting 1993, Lowe 1991, Oscarson 1993, Peterson 1990, Schofield 1991.

[3]Al^{+3} includes the Al present in cancrinite and $Al(OH)_3$.

[4]Total Organic Carbon includes HEDTA, EDTA, hydroxyacetic acid, citric acid, and other degradation products.

Castaing, B.A. 1993, *101-AY, 102-AY, and 106-C Data Compendium*, WHC-SD-WM-TI-578, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Gerboth, D.M., 1987, *B Plant NCAW Process Test Report*, WHC-SD-WM-PTR-006, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Hendrickson, D.W. and J.M. Conner 1994, *Grout Treatment Facility Waste Feed Projections*, WHC-SD-WM-TI-528, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Herting, D. L., 1993, *Effect of Tank 107-AN Caustic Addition on Radionuclide Solubilities*, (internal letter 12110-PCL93-043 to M. J. Kupfer, May 25), Westinghouse Hanford Company, Richland, Washington.

Lowe, S. S., 1991, *Preliminary Material Balances for Pretreatment of NCAW, NCRW, PFP, and CC Wastes*, WHC-SD-WM-TI-492, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Oscarson, E. E. and L. A. Tusler, 1993, *Radionuclide and Chemical Inventories for the Double Shell Tanks*, WHC-SD-WM-TI-543, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Peterson, M. E., 1990, , *Revised Report on the Results of 102-AY Characterization*, (internal memo 9000855 to A. J. DiLiberto and L. M. Sasaki, February 12), Pacific Northwest Laboratories, Richland, Washington.

RHO, 1985, *Hanford Defense Waste Disposal Alternatives: Engineering Support Data for the HDW-EIS*, RHO-RE-ST-30P, Rockwell Hanford Operations, Richland, Washington.

Schofield, J. S., 1991, *Estimation of Neutralized Current Acid Waste and Neutralized Cladding Removal Waste Constituents*, (internal memo 85440-91-018 to S. L. Barker, July 18), Westinghouse Hanford Company, Richland, Washington.

A number of documents and laboratory reports provide estimates for the chemical composition of wastes in subsets of the 28 DSTs at the Hanford Site.

These reports rely on tank sample data and, to a lesser extent, on estimates of chemical additions during plant operations. These reports form the basis for the DST data presented in Table 1.

To estimate the soluble and insoluble fractions for each DST, solubility factors, which represent the amount of each component assumed to be soluble in water, were calculated based on tank samples and historical data. These "wash factors" given for several waste types are listed in Table G1-1 (Boomer et al. 1993).

2.2 RADIONUCLIDE INVENTORY

The SST radionuclide inventory was derived from the Track Radioactive Components (TRAC) radionuclide database (Jungfleisch and Simpson 1993). An evaluation of the distribution of radionuclides in the SSTs, as predicted by TRAC, indicate some discrepancies. The inventories were adjusted so that the total radionuclide inventories reflect the adjustments made to the 1994 IDB (Powell 1994). The final data are shown in Table 2.

An explanation of the SST adjustments is as follows.

^{137}Cs. The total system inventory for ^{137}Cs includes the capsule, SST and DST inventories. The total system inventory is derived from historical fuel reprocessing information. In updates to the IDB, a decrease in the ^{137}Cs capsules inventory was made based on calorimetry data because of past overestimating. However, a corresponding increase was never made for the ^{137}Cs inventory in SSTs and DSTs. Based on a presentation by D. D. Wodrich to the U.S. National Regulatory Commission (July 1992), the waste inventory for ^{137}Cs in DSTs is 26.8 MCi, decayed to December 31, 1999 (excluding daughters). This inventory is based on a technical analysis of both core and bottle-on-a-string sample data. The SST inventory shown in Table 2 is derived by subtracting the capsule and DST inventory from the total system inventory.

^{151}Sm. The inventory in pre-1983 DST waste was increased to match a total of 0.85 MCi presented in the Hanford Defense Waste-Environmental Impact Statement.

^{99}Tc. After completion of jet pumping, the SST ^{99}Tc amount was adjusted to 11 kCi so that the distribution between SST and DSTs matches the IDB.

^{129}I. The ^{129}I was decreased in SSTs and increased in DSTs to account for transfers from SSTs to DSTs. Because ^{129}I is soluble even in the alkaline waste, the proportion between SSTs and DSTs, after jet pumping is the same as for ^{99}Tc.

^{239,240}Pu. The inventory in SSTs was adjusted downward to 22 kCi as a result of jet pumping. Since ^{239}Pu is insoluble in the alkaline waste system, it is expected to be in the sludge, and therefore will not transfer as a result of jet pumping. However, during the process to extract strontium activity from wastes, complexants were added. The waste from that process, which became part of the complexant concentrate, contained plutonium and americium activity which were solubilized by the complexants.

^{241}Am. The inventory in the SSTs was decreased so that the total, 33 kCi, matches the IDB. Part of this decrease is due to the americium that remained after extraction from encapsulation (see plutonium explanation above). The other part of this decrease is due to liquid transfers from SSTs to DSTs.

Estimates for the relative concentrations of critical DST radionuclide isotopes are based on existing laboratory data and characterization reports. Only ^{90}Sr, ^{137}Cs, ^{237}Np, ^{239}Pu, and ^{241}Am activities are consistently reported by the laboratories. Once the relative concentrations for each tank were established, they were normalized to agree with the cumulative inventories found in the 1994 IDB (Powell 1994). Estimates for the isotopes of ^{239}Pu, ^{238}Pu, ^{240}Pu, ^{241}Pu, are made for each tank by multiplying by the ratio of the isotope to ^{239}Pu as reported in the IDB. The decay daughters, ^{137}Ba and ^{90}Y, are also provided.

2.3 FUTURE TANK WASTE

Table 3 estimates the amount of future tank waste by type and lists the total production (cubic meters) of each waste type for the time period indicated. This projection assumes that as soon as the 242-A Evaporator alleviates some of the tank space shortage, additional waste generation will occur. These generations are because of facility holdup, cell and basin cleanout, decommissioning activities, and miscellaneous non-routine processes. As tank space allows, the wastes listed in Table 3 will be generated and accepted into the DSTs.

Table 2. Radionuclide Inventory for Single-Shell Tanks and Double-Shell Tanks[1] in Curies. (3 sheets)

Radionuclides	Single-Shell Tanks Total	Double-Shell Tanks[2]		
		Soluble	Insoluble	Total
Ac-225	1.98E-05			
Ac-227	2.21E-02			
Ac-228				
Am-241 [2]	3.30E+04	5.31E+03	6.54E+04	7.07E+04
Am-242	6.82E+01			
Am-242m	6.86E+01			
Am-243	3.32E+01			
At-217	1.98E-05			
Ba-135m				
Ba-137m	7.68E+06	2.48E+07	6.49E+05	2.54E+07
Bi-210	7.17E-08			
Bi-211	2.21E-02			
Bi-212	3.72E-14			
Bi-213	1.98E-05			
Bi-214	2.70E-07			
C-14 [3]	3.00E+03	3.45E+02	1.99E+03	2.34E+03
Cm-242	5.66E+01			
Cm-244	1.18E+02			
Cm-245	1.04E-02			
Cs-135	1.45E+02			
Cs-137	8.12E+06	2.61E+07	6.83E+05	2.68E+07
Eu-154		5.37E+04	1.44E+03	5.51E+04
Fr-221	1.98E-05			
Fr-223	3.06E-04			
I-129 [3]	1.60E+01			
Nb-93m	3.20E+03			
Ni-59	5.03E+03			
Ni-63	2.69E+05			
Np-237	6.97E+01			
Np-238	3.26E-01			
Np-239	3.32E+01			
Pa-231	3.80E-02			
Pa-233	6.97E+01			
Pa-234	7.69E-01			
Pa-234m	4.81E+02			
Pb-209	1.98E-05			
Pb-210	7.17E-08			
Pb-211	2.21E-02			
Pb-212	3.72E-14			
Pb-214	2.70E-07			
Pd-107	8.65E+01			
Po-210	7.17E-08			
Po-211	6.04E-05			
Po-212	2.38E-14			
Po-213	1.94E-05			
Po-214	2.70E-07			

Table 2. Radionuclide Inventory for Single-Shell Tanks and Double-Shell Tanks[1] in Curies. (3 sheets)

Radionuclides	Single-Shell Tanks Total	Double-Shell Tanks[2]		
		Soluble	Insoluble	Total
Po-215	2.21E-02			
Po-216	3.72E-14			
Po-218	2.70E-07			
Pu-236				
Pu-238	1.08E+03			
Pu-239 [3]	1.80E+04	1.31E+03	7.05E+03	8.36E+03
Pu-240 [3]	4.30E+03	3.28E+02	2.07E+03	2.40E+03
Pu-241	3.55E+04	7.76E+02	3.86E+06	3.94E+04
Pu-242	4.32E-04			
Ra-223	2.21E-02			
Ra-224	3.72E-14			
Ra-225	1.98E-05			
Ra-226	2.70E-07			
Ra-228	7.42E-14			
Rh-106	3.79E-02			
Rn-219	2.21E-02			
Rn-220	3.72E-14			
Rn-222	2.70E-07			
Ru-106	3.79E-02			
Sb-126	8.78E+01			
Sb-126m	6.27E+02			
Se-79	9.11E+02			
Sm-151 [3]	6.30E+05			
Sn-126	6.27E+02			
Sr-90 [3]	4.36E+07	6.15E+05	9.47E+06	1.01E+07
Tc-99 [3]	1.10E+04	2.07E+04	3.99E+02	2.11E+04
Th-227	2.18E-02			
Th-228	3.72E-14			
Th-229	1.98E-05			
Th-230	3.90E-05			
Th-231	2.06E+01			
Th-232	6.42E-13			
Th-233				
Th-234	4.81E+02			
Tl-207	2.21E-02			
Tl-208	1.34E-14			
Tl-209	4.28E-07			
U-232				
U-233	1.21E-02			
U-234	2.12E-01			
U-235	2.06E+01			
U-236	2.88E-03			
U-237	8.69E-01			
U-238	4.81E+02			
Y-90	4.36E+07	6.15E+05	9.47E+06	1.01E+07
Zr-93	3.94E+03			
TOTAL	1.04E+08	5.23E+07	2.04E+07	7.27E+07

Table 2. Radionuclide Inventory for Single-Shell Tanks and Double-Shell Tanks[2] in Curies. (3 sheets)

Notes:

[1]Radionuclides decayed to December 31, 1999.

[2]Total values taken from the following references: Castaing (1993), Gerboth (1987), Hendrickson (1994), Herting (1993), Lowe (1991), Oscarson (1993), Peterson (1990), Schofield (1991).

[3]Single-shell tank amounts adjusted to be consistent with the 1994 Integrated Database.

Castaing, B.A. 1993, *101-AY, 102-AY, and 106-C Data Compendium*, WHC-SD-WM-TI-578, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Gerboth, D.M., 1987, *B Plant NCAW Process Test Report*, WHC-SD-WM-PTR-006, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Hendrickson, D.W. and J.M. Conner 1994, *Grout Treatment Facility Waste Feed Projections*, WHC-SD-WM-TI-528, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Herting, D. L., 1993, *Effect of Tank 107-AN Caustic Addition on Radionuclide Solubilities*, (internal letter 12110-PCL93-043 to M. J. Kupfer, May 25), Westinghouse Hanford Company, Richland, Washington.

Lowe, S. S., 1991, *Preliminary Material Balances for Pretreatment of NCAW, NCRW, PFP, and CC Wastes*, WHC-SD-WM-TI-492, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Oscarson, E. E. and L. A. Tusler, 1993, *Radionuclide and Chemical Inventories for the Double Shell Tanks*, WHC-SD-WM-TI-543, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Peterson, M. E., 1990, , *Revised Report on the Results of 102-AY Characterization*, (internal memo 9000855 to A. J. DiLiberto and L. M. Sasaki, February 12), Pacific Northwest Laboratories, Richland, Washington.

Schofield, J. S., 1991, *Estimation of Neutralized Current Acid Waste and Neutralized Cladding Removal Waste Constituents*, (internal memo 85440-91-018 to S. L. Barker, July 18), Westinghouse Hanford Company, Richland, Washington.

Table 3. Post Evaporator Nonroutine Waste Additions[1].

Facility	Waste type	Volume (m^3)	Duration of accumulation
PUREX: Deactivation waste	DN[2]	5,700	FY 94-FY 97
B Plant: Terminal cleanout waste (concentrated)	DN	2,100	FY 97-FY 01
100 Area: Terminal cleanout waste (concentrated)	DSSF[3]	2,200	FY 95-FY 99
100 Area: Sulfate waste	DN	140	
300 Area: Fuel supply clean-out	DN	45	
105-F, 105-H: Basin clean-out	DN	850	
Tank 107-AN: Caustic addition	DN	190	
Total		11,200	

Notes:

[1]Taken from Table A-2 (Koreski and Strode 1994).

[2]Dilute noncomplexed waste

[3]Double-shell slurry feed

Koreski, G.M. and J.N. Strode, *Operational Waste Volume Projection, February 1994*, WHC-SD-WM-ER-029, Rev. 19, Westinghouse Hanford Company, Richland, Washington.

3.0 REFERENCES

Boomer, K. D., A. L. Boldt, J. D. Galbraith, J. S. Garfield, C. E. Golberg, B.A. Higley, L. J. Johnson, M. J. Kupfer, R. M. Marusich, R. J. Parazin, A. N. Praga, G. W. Reddick, J. A. Reddick, E. J. Slaathaug, L. M. Swanson, T. L. Waldo, and C. E. Worcester, 1993, *Tank Waste Technical Options Report*, WHC-EP-0616, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Castaing, B. A., 1993, *101-AY, 102-AY, and 106-C Data Compendium*, WHC-SD-WM-TI-578, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Gerboth, D. M., 1987, *B Plant NCAW Process Test Report*, WHC-SD-WM-PTR-006, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Hendrickson, D. W. and J. M. Conner, 1994, *Grout Treatment Facility Waste Feed Projections*, WHC-SD-WM-TI-528, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Herting, D. L., 1993, *Effect of Tank 107-AN Caustic Addition on Radionuclide Solubilities*, (internal letter 12110-PCL93-043 to M. J. Kupfer, May 25), Westinghouse Hanford Company, Richland, Washington.

Jungfleisch, F. M. and B. C. Simpson, 1993, *Preliminary Estimation of the Waste Inventories in Hanford Tanks Through 1980*, RHO-SD-WM-TI-057, Rev. 0-A, Westinghouse Hanford Company, Richland, Washington.

Koreski, G. M. and J. N. Strode, 1994, *Operational Waste Volume Projection, February 1994*, WHC-SD-WM-ER-029, Rev. 19, Westinghouse Hanford Company, Richland, Washington.

Lowe, S. S., 1991, *Preliminary Material Balances for Pretreatment of NCAW, NCRW, PFP, and CC Wastes*, WHC-SD-WM-TI-492, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Oscarson, E. E. and L. A. Tusler, 1993, *Radionuclide and Chemical Inventories for the Double Shell Tanks*, WHC-SD-WM-TI-543, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Peterson, M. E., 1990, , *Revised Report on the Results of 102-AY Characterization*, (internal memo 9000855 to A. J. DiLiberto and L. M. Sasaki, February 12), Pacific Northwest Laboratories, Richland, Washington.

Powell, R. W., 1994, *Request for Office of Waste Management, Integrated Data Base High-Level Data Information Update*, (external letter 940463B, Rev. 2 to L. Erickson, DOE-HQ, November 4), Westinghouse Hanford Company, Richland, Washington.

RHO, 1985, *Hanford Defense Waste Disposal Alternatives: Engineering Support Data for the HDW-EIS*, RHO-RE-ST-30P, Rockwell Hanford Operations, Richland, Washington.

Schofield, J. S., 1991, *Estimation of Neutralized Current Acid Waste and Neutralized Cladding Removal Waste Constituents*, (internal memo 85440-91-018 to S. L. Barker, July 18), Westinghouse Hanford Company, Richland, Washington.

Waite, J. L., 1991, *Tank Wastes Discharged Directly to the Soil at the Hanford Site*, WHC-MR-0227, Westinghouse Hanford Company, Richland, Washington.

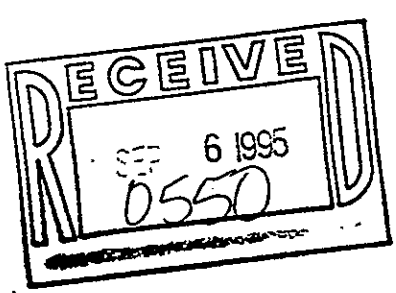
This page intentionally left blank.

9513385.1695

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	L. E. Borneman	Date July 21, 1995
Project Title/Work Order		EDT No. 612471
Data Packakage to Support TWRS EIS		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach. / Appendix Only	EDT/ECN Only
Central Files	A3-88	X (2)			
C. P. Bader	S7-51				X
L. E. Borneman	R2-06	X			
W. T. Dixon	H6-21				X
G. L. Dunford	S7-81	X			
B. G. Erlandson	H6-20				X
J. G. Field	G2-02				X
E. A. Fredenburg	S2-48	X			
J. M. Garcia	R3-09				X
C. J. Geier	R2-36				X
C. A. Haass	S7-51	X (2)			
J. O. Honeyman	S7-81				X
L. Lee	R2-50				X
L. Ramble	H4-60				X
A. M. Umek	S7-81				X
J. Weber	S1-57				X
R. D. Wojtasek	S7-84				X
LEB File/LB	R2-06				X



RECEIVED
L.E. BORNEMAN

JUL 31 1995

ACTION _____
COPIES _____
ROUTE _____
FILE _____